WARM UP:

Worksheet 6A from yesterday:

6) Given a normal distribution with a mean of 25, what is the std. deviation if 18% of the values are above 29?

Worksheet 6B (from notes):

2) A water dispensing machine is designed to dispense water into a cup with an average volume of 12.2 oz. & a std. dev of 0.5 oz.

(a) What % of the cups end up with at least 12 oz of water?
(b) 75% of the cups contain MORE than how much water?
(c) Find the IQR for the amount of water dispensed.
(d) Find the 90th percentile for the amount of water dispensed.

3) Given a normal distribution with a std. dev. of 10, what is the mean if 21% of the data is below 50?

6) 4.37 units

2) $N(12.2, 0.5)$

(a) $P(X > 12) = 0.6554 = 65.54\%$

(b) $P(X > A) = 0.75$ $A = 11.863$ oz.
$P(X < A) = 0.25$

(c) $P(X < Q1) = 0.25$ $Q1 = 11.863$ oz. $IQR = 0.674$ oz.
$P(X < Q3) = 0.75$ $Q3 = 12.537$ oz.

(d) $P(X < B) = 0.90$ $B = 12.841$ oz.

3) 58.06 units

BOOK PROBLEMS:

p. 130 #13, 17, 19, 22, 32, 41, 42, 48

13) Derrick:	first $Z = 1.5$	second $Z = 0$	total $Z = 1.5$
Julie:	first $Z = 0.5$	second $Z = 2$	total = 2.5

When we convert all test scores to Z scores (so they are all measured in the same units), we can see that Julie totaled 2.5 standard deviations above the means, and Derrick only totaled 1.5 std. deviations above the means.

17) $N(1152, 84)$

(a) $Z = (1000 - 1152)/84 = -1.8095$ std. deviations below the mean

(b) for 1000 lbs, $Z = -1.8095$
for 1250 lbs, $Z = 1.1667$

The steer weighing 1000 lbs is more unusual because it is more std. deviations away from the mean.

19) N(1152, 84)

(a) N(152, 84) * only the mean changes
(b) N($460.80, $33.60) * multiply both by $0.40

22) mean = 28
std. dev = 2.4
max = 33
IQR = 3.2

$100 + $10(mile over 20)

mean = 100 + 10(8) = $180
std. dev = 10(2.4) = $24
max = 100 + 10(13) = $230
IQR = 10(3.2) = $32

32) Yes, the Normal model is appropriate. The histogram is roughly symmetric and unimodal, the normal probability plot is roughly linear. The one outlier identified in the boxplot is not that far away from the rest of the data, and does not skew the distribution

41) N(1152, 84)

(a) $P(X < A) = 0.40$ invnorm(0.40, 1152, 84)

$A = 1130.72$ lbs

(b) $P(X < B) = 0.99$ invnorm(0.99, 1152, 84)

$B = 1347.413$ lbs.

(c) $P(X < Q1) = 0.25$ $Q1 = 1095.343$ lbs

$P(X < Q3) = 0.75$ $Q3 = 1208.657$ lbs

$IQR = Q3 - Q1 = 113.314$ lbs

42) $N(100, 16)$

(a) $P(X < C) = 0.15$ invnorm(0.15, 100, 16)

$C = 83.417$ points

(b) $P(X < D) = 0.98$ invnorm(0.98, 100, 16)

$D = 132.86$ points

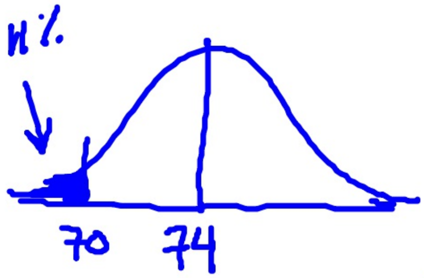
(c) $P(X < Q1) = 0.25$ $Q1 = 89.208$ points

$P(X < Q3) = 0.75$ $Q3 = 110.792$

$IQR = Q3 - Q1 = 21.584$ points

48) N(74, ?)

(a) 11% too small = 11% below 70 grams



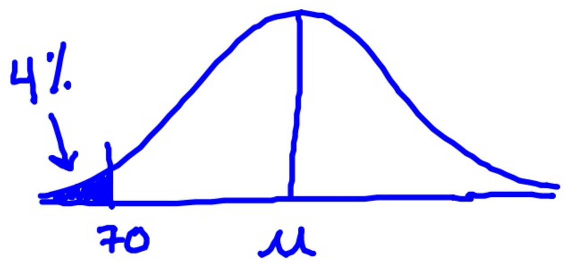
$$z = \frac{70-74}{\sigma}$$

invnorm(0.11,0,1)

$$-1.227 = \frac{70-74}{\sigma}$$

$$\sigma = 3.261\,g$$

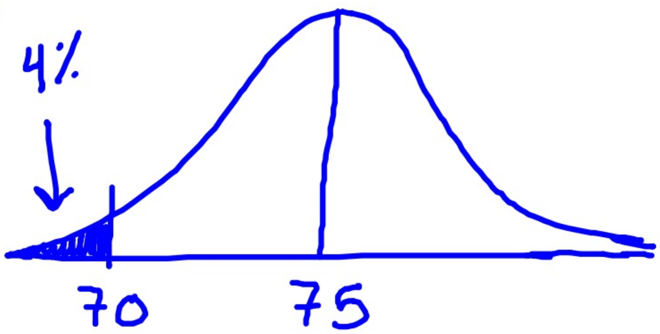
(b)



$$z = -1.751 = \frac{70 - \mu}{3.261}$$

$$\mu = 75.708 \text{ g}$$

(c)



$$z = -1.751 = \frac{70-75}{\sigma}$$

$$\boxed{\sigma = 2.856\,g}$$